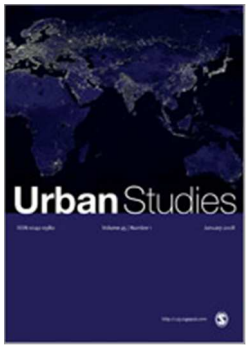

Repositioning urban governments? Energy efficiency and Australia's changing climate and energy governance regimes

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Introduction

As international attempts to build effective frameworks for global climate governance have remained mired in uncertainty and disappointment, national and local governance action has proliferated. Cities in particular have emerged across the globe as a key scale of climate governance (Bulkeley & Castán Broto, 2012; Anguelovski & Carmin, 2011; Hoffman, 2011). One measure of this is the scope of membership of urban climate action networks such as the International Council for Local Environmental Initiatives (ICLEI)i, Cities for Climate Protection, the Climate Alliance and the US Mayors' Climate Protection Agreement. Another is the proliferation of the community-based Transition Town movement (Scott-Cato and Hillier, 2010).

Despite constitutional constraints, urban local governments in particular have emerged as important players as they extend traditional powers and roles to climate governance and develop new roles that leverage their capacities to drive behaviour change, materialise low carbon built environments and economies, and enable transitions to low-carbon energy systems and practices. The widening role of urban local governments emphasises the need for multi-level understandings of climate governance on the one hand (Leck and Simon, 2013) and, on the other, for deeper understandings of the various ways local governments are being drawn into climate governance (Anguelovski & Carmin, 2011; Bulkeley and Schroeder, 2009; Gustavsson et al, 2009; While et al, 2009; Granberg and Elander, 2007). In this policy review, we address both these themes as we explore the recent evolution of Australia's climate and energy governance regimes, how this evolution frames energy efficiency as a climate change issue, and the implications of this for embedding urban local governments as implementers and in new innovative partnership roles.

We suggest this has important implications for positioning the city as a strategic site and space in the emergent politics of energy in the context of climate change.

A review of the Australian context offers unique insights. Internationally, there is an uneven landscape of cooperation, collaboration and policy alignment between national and sub-national governments when it comes to climate and energy govenrance and the national enabling framework for local government is highly variable (Bulkeley *et al.*, 2011; Martinot, 2011). While national/local relations and policy frameworks in the European context have generally been supportive, the US context has been more antagonistic (Selin and Vendeveer, 2009). In Australia, as the climate governance regime continues to take shape, such alignments are evolving with significant implications for local government. Australian local government lacks constitutional status, being a creature of state government with limited wider regulatory powers. Federal and state political authorities have historically granted them limited institutional recognition and have been reluctant to recognise them as legitimate partners in climate governance (Storey *et al.*, 2012; Urbis, 2010). Like local governments internationally, Australian local governments are largely dependent on the resources and the politically-driven priorities of federal and state government[ii] (Bulkeley, 2000). Broader metropolitan-scaled functions (strategic planning, infrastructure provision, urban services) are state government responsibilities. Urban local government authorities (LGAs) are fragmented (eg Sydney has 43 LGAs) and tasked with the provision and maintenance of community facilities, local services, and local roads as well as local town planning and development approvals. When it comes to climate change responses, urban local governments' capacity has been limited by inadequate cooperation and coordination with state government and by both Federal and state reluctance, to date, to align climate policy with city development issues (Jones, 2012a).

Yet internationally, in a context whereby neoliberal (amongst other) thrusts have seen the divisions between public/private authority in urban governance reworked and reconfigured (M[c]Guirk and Dowling, 2009), established channels of local government policy making, implementation and forms of authority have been rearticulated and some of the most advanced carbon management strategies have been put in place within the local government sector (for instance through their involvement in Cities for Climate Protection: ttp://www.iclei.org/index.php?id=11343)[iii]. Despite their constitutionally and structurally weak positioning, Australian urban local governments are no exception here. Their active role in inconstant circumstances has seen them undertake innovative and experimental climate governance initiatives and projects, especially in the larger cities[iv], often in partnership with other local government authorities or community organisations (for a recent review see Storey *et al.*, 2012; Hoff, 2010; Urbis, 2010; Zeppel, 2012). Moreover, reflecting their contextual dependence, they have repeatedly lobbied for national carbon regulation, consistent legal and policy frameworks to support climate governance at state and federal levels, and resourcing and recognition of their capacity as climate change actors (Hoff, 2010; Storey *et al.,* 2012).

Against this backdrop of urban local government climate change activism, both the dynamism in Australian multi-level climate and energy governance and the tight coupling of the energy efficiency and climate change policy agenda are having significant implications for expanding recognition and expectations on local government as well as extending its roles and capacities in the emergent climate governance regime. As energy efficiency agendas and climate change responses converge, with energy efficiency being reframed as a climate change issue, urban actors are becoming increasingly strategically important to the governance of the energy system though local responses to energy efficiency. This, we argue, points to a reworking the role of cities, and

urban local governments in particular, in the governance of climate and energy and in their emergent politics.

In what follows, we first review the evolution of Australia's climate governance regime and position energy efficiency within that regime. We then consider the impacts of this evolution for urban local governments and, focussing on NSW, characterise the ways in which their capacities and capabilities are being mobilised in three significant ways, in the context of a changing multi-level political opportunity structure around energy efficiency: (i) as drivers of the reconfiguration of local infrastructure (ii) as partners in energy efficient/ low carbon energy experimentation and demonstration; and (iii) as enablers of retrofitting the urban built environment. This, we argue, is not only locating local governments in implementation but also engaging them as partners in conceiving and operationalizing new measures that, together, suggest new ground is being opened in the urban politics of climate and energy governance. As such, the Australian context provides important insights into how the urban is implicated in evolving climate change responses and governance regimes and, crucially, in the evolving architecture and politics of energy governance.

Energy efficiency and the city in Australia's shifting climate and energy governance

While energy efficiency has traditionally been associated with the security of energy supply, it has progressively been reframed internationally as a climate change issue (Urge-Vorsatz and Metz, 2009). In the Australian case, this is resulting in a notable intensification of the energy efficiency imperative as one means of addressing the intransigence of fossil-fuel dependency in Australia's energy supply system. Crucially though, the need for energy efficiency to be realised through local responses means that mobilising the energy efficiency agenda involves a strategic relocation of

urban actors—and urban local governments particularly—in governing the energy system, and a reworking of the multi-level relationship between federal, state and local levels of government.

The nexus of Australia's climate and energy governance reflects two conditions that have limited opportunities for a thorough-going transition in the energy supply system to date and that thus suggest energy efficiency as a more effective and immediate climate governance pathway. First, Australia's current (unsettled) regime of climate governance reflects the political-economic conditions of its formation. From a climate policy perspective the country has a 'difficult economic profile' in that it derives its competitive advantage from plentiful cheap energy (especially coal) and from its location in the lucrative energy markets of the Asia-Pacific (Curran, 2009). The nation's status as producer and net exporter of energy has shaped the fossil-fuel based energy production system that underpins the Australian urban-economic system. Currently, electricity generation is the single largest producer of greenhouse gases (accounting for 35% of total emissions) (DCCEE, 2012) and 75% of electricity generation is coal-fired, making Australia's electricity industry one of the most carbon-intensive electricity production systems in the world (Commonwealth of Australia, 2011). The influential position of mining and energy interests in the political economy and in the climate policy community have presented formidable obstacles to significant energy transition, such that the national climate governance regime reflects both a reluctance to dislodge the country's fossil-fuel dependence (Bulkeley, 2001; Harrison, 2012) and a fractious climate politics in which, despite government discourses of ecological modernisation, environment and economy continue to be pitted against each other (Curran, 2009).

The second condition relates to the interaction of these climate politics with the complexity of Australia's federal governance structure which has limited the capacity to drive systemic transition in the energy supply system and to effect climate governance measures. Australia's constitutional arrangements require multilevel cooperation to induce significant change in governing areas

critical to climate response (e.g. energy policy and infrastructure [federal and state], land use planning and building [state and local], transport [federal, state and local]). This, along with the policy vacuum derived from delays in cohering piecemeal federal efforts into an effective national climate response, has created a characteristically multilevel climate governance 'regime' widely critiqued as overlapping, reactive and *ad hoc* (Daley *et al.,* 2011; Griffiths *et al*., 2007; Jones 2012b; Productivity Commission, 2011). Frustration, fuelled by growing environmental sentiment in the electorate, led state governments especially in New South Wales (NSW) and Victoria to take leadership, while urban-based local governments emerged as internationally-networked climate activists despite their limited powers and weak constitutional position (Bulkeley and Schroeder, 2009; Jones, 2012a). Thus, alongside federal policies and programs, a profusion of state and local government policy responses and climate initiatives have emerged, paralleled by an uneven landscape of initiatives by business reflecting the plural and particular stake-holder interests of diverse sectors[v]. The complexity, inconstancy and uncertainty associated with this mosaic of fluid programs and short-lived projects have presented intense challenges to systemic transition in the energy supply system, significantly constraining investments in renewable energy infrastructures and technologies (Daley *et al.*, 2011).

These two conditions have meant that while energy efficiency has been on the governance agenda in Australia since the 1980s, it has risen to prominence particularly as part of the climate change debate and is becoming strategically central to Australia's efforts to manage its energy production system and to address carbon reduction commitments, with flow-on effects for the strategic importance of the urban in the climate governance regime. Internationally, energy efficiency entered the policy agenda in the 1970s in association with oil shocks and wider concerns for housing quality and fuel poverty (Lovell, 2004). At this stage, some states in Australia introduced action to promote residential and commercial energy efficiency and a National Appliance and

Equipment Energy Efficiency Committee was established in the 1980s. In the 1990s the issue became coupled with greenhouse gas reduction as the NSW government established a Sustainable Energy Development Authority (1996) which included a specific remit to reduce emissions through energy efficiency measures. While these actions were effective in producing some demand reduction (Geller *et al.*, 2006), Australia's history of cheap and relatively unlimited energy supply have meant that it has generally lagged behind international best practice on energy efficiency (PMTGEE, 2010). In 2010, the International Energy Agency found Australia to have fully implemented less than 20% of its 25 key energy efficiency recommendations (PMTGEE, 2010, p36). However, the innovative coupling of energy efficiency with climate change and emissions abatement by the NSW state government in the late 1990s has more recently been generalised as the climate governance regime has increasingly turned its attention to energy efficiency as a means of meeting its new policy ambitions. The National Framework for Energy Efficiency and a National Appliance and Equipment Energy Efficiency Framework, introduced in 2004, were supplanted in 2009 by a National Strategy on Energy Efficiency (NSEE). The NSEE was agreed across federal and state governments and has aimed to improve minimum standards for energy efficiencies across buildings, equipment and appliances and to accelerate the uptake of new energy-efficient products and technologies, especially so as to prepare households and business for the anticipated energy price impact of a price on carbon[vi]. Nonetheless, investment in energy efficiency has arguably been inhibited by the priorities of energy transmission and distribution companies, which have favoured 'poles and wires' investment in network upgrades to address peak demand. Major energy price increases in Australia attributed to these 'gold-plating' strategies have been extremely politically contentious, in recognition of the significant tension between network upgrade and demand management/energy efficiency approaches (West 2013).

By 2010, the Prime Ministers' Task Group on Energy Efficiency (PMTGEE, 2010: 1)) could still position energy efficiency as "Australia's untapped energy resource" and also observed that the NSEE did not address the key issue of governance and the proliferation of overlapping and inconsistent federal, state, territory and regional measures. However, the Federal Government's *Clean Energy Future* climate change plan, introduced in 2011 against a volatile political backdrop, goes some way towards creating a more coherent governance framework. The plan includes four key elements: (i) the much-contested Clean Energy Act[vii] (passed in late 2011) which introduced a fixed-price tax on carbon for major emitters, converting to an Emissions Trading Scheme (ETS) in 2015; (ii) support for clean technologies, specifically a A$10b Clean Energy Finance Corporation to invest in renewable energy, low pollution and energy efficiency technologies. This includes strong investment in measures to support technical innovation that can maintain the fossil-fuel energy sector (eg Clean Coal technologies and Carbon Storage and Capture); (iii) support for direct action in the farming and land management sectors; and, crucially, (iv) significant additional support to promote energy efficiency (Commonwealth of Australia, 2011).

The *Clean Energy Future* package is inducing a new dynamism in the policy environment. All Australian states agreed to review their existing climate change programs with a view to their complementarity with a national ETS and the effects of this review are rippling out across the multi-level policy landscape as state and local governments react to the new position of the federal government through institutional rearrangements, program rationalisation and re-imagining. Together, the NSEE, the *Clean Energy Future* package and the governance dynamism it has induced, ensure that energy efficiency has been placed at the heart of the newly emergent climate governance regime. This tight coupling of the energy efficiency and climate change policy agenda creates the specific context for a distinct repositioning of urban local governments as their

enrollment in governing climate and a lower carbon energy system, especially through enabling and implementing energy efficiency initiatives, is being reimagined and reinstitutionalized.

Urban local governments and strategic repositioning in climate and energy governance

Despite lacking substantive powers over key policy areas relevant to climate change, local governments in Australia have been climate activists, reducing emissions through 'self-governing' measures targeting the emissions of the local government authority and its operations, and promoting broader community emissions-reduction through a range of 'enabling' activities (e.g. education, information provision and local service provision) (see Bulkeley and Kern, 2007; Pillora, 2010; Jones, 2012a). They have been innovators and experimenters (for a recent review see Storey *et al.*, 2012; Hoff, 2010; Urbis, 2010; Zeppel, 2012). Yet the absence of a national ETS had meant they could not enforce any ambitious emissions reductions targets they may set (Jones, 2012b). Their effectiveness and strategic importance has been limited by the lack of cooperation and coordination with state government, by the lack of institutional recognition granted to them by federal and state governments as legitimate partners in climate governance and, crucially, by federal and state reluctance to align climate policy with city development issues (Storey *et al.,* 2012; Urbis, 2010). Recent developments around the politics of energy efficiency suggest this is changing.

There have been indications of a growing willingness to recognise and to institutionalise local governments' role in climate and energy governance beyond the traditional expectation that they should manage community engagement, behaviour change and awareness campaigns. Federal support of local governments' role, which had characteristically been at arms-length[viii], has become more direct and, arguably, more strategic. One example is the federal support for the

production of local government climate change toolkits and adaptation action plans. Another is the establishment of the Australian Council of Local Government (2008) 'so (federal government) can hear from and talk to all levels of government' in key domains affecting climate governance such as urban planning and infrastructure development (cited in Pillora, 2010). Most strikingly, the federal government has recently proposed a referendum (to be held alongside the 2013 federal election) on granting constitutional recognition to local government. This would secure federal government's capacity to provide financing *directly* to local governments, for example for infrastructure investment. The emergent policy and program context around energy efficiency, however, provides particularly persuasive evidence of a shifting positioning that not only locates local government centrally in the implementation of climate and energy governance measures, but increasingly engages local government as partners in conceiving and operationalising innovative and strategic governance measures.

The current fluidity and dynamism in Australia's climate governance regime means that a complex landscape of measures governing energy efficiency persists. Policies and programs target cross-cutting sectors and a variety of governance practices are deployed across these sectors[ix]. Yet, reflecting the growing recognition that energy consumption in buildings accounts for 20% of Australia's emissions (Commonwealth of Australia, 2009), there is a discernible focus in the current landscape of federal and state policy and programs on measures to promote energy efficiency in the built environment and, more specifically, in buildings. The result for urban local governments most particularly is that their position and role in the governance and the implementation of energy efficiency measures is being reconfigured in recognition of their capacity as key actors in the regulation and management of buildings and as curators of multiple energy-consuming public facilities and infrastructures.

Table 1 summarises the current federal and NSW state policies and programs that, first, set a wider enabling framework for energy efficiency and, second, that explicitly mobilise local government capacities and capabilities in three distinctive if interconnected ways that we elaborate below. At the most straightforward level, there is a suite of programs that directly enable local governments to act as drivers in reconfiguring the energy efficiency of local infrastructure, through providing various forms of funding. For example, the federal government *Local Government Energy Efficiency Program* supports local government to install energy efficient solar or heat pump hot water systems in local community facilities. Similarly the *Community Energy Efficiency Program* assists local governments, not-for-profits and community organisations to undertake energy efficiency upgrades to community-use buildings, facilities and lighting. This was closely mirrored in the NSW government's *Public Facilities Program*. These schemes enable local government by providing directed finance and position them, amongst others, as demonstrators of improved energy management practices to encourage wider adoption. In July 2012 the federal government announced $42m of grant co-funding through this scheme for 63 energy-efficiency projects addressing community facilities. This included many projects for upgrading street lighting across local government jurisdictions to low energy forms: something that had been initially piloted by the Cities for Climate Protection network. A further round of projects for funding are currently under consideration. In this sense, local governments are being resourced to consolidate roles in implementing energy efficiency upgrades they had commenced taking on independently.

While the above schemes primarily involve local governments in bounded project-level implementation, several other federally-supported governance programs are extending their roles strategically by driving cross-sectoral collaborations that locate local governments as key partners in energy efficient/ low carbon energy experimentation and demonstration. The large-scale *Solar*

Cities and *Smart Grid Smart City* programs, for instance, are large scale federally-subsidised demonstrations which are experimenting with wider visions of energy system transformation. They work through complex, multi-sector partnerships that position local government at the innovative edge of emergent governance mechanisms. The *Solar Cities* program, has been implemented in seven urban sites around Australia, including the Blacktown LGA in Sydney which, with a population of over 300 000, is one of the most populous LGAs in Australia. It subsidised consortia of local government with energy, finance and land corporations with a stake in the urban and energy development of the city to trial a complex array of new solar and energy efficient technologies and showcase market viability and energy efficiency gains. The *Smart Grid Smart City* initiative is funding a $100m demonstration project in Newcastle, NSW, involving local government in a multifaceted experiment aimed to deliver Australia's first commercial-scale smart grid in partnership with the energy sector. Analysis of smart grid costs and benefits is targeted to inform future decisions by governments, electricity providers and technology suppliers. These schemes leverage local government capacities to nurture local partnerships, to mobilise community interest and buy-in, and to provide crucial legitimacy to governmental programs aimed at energy transformations, efficiency and demand reduction.

Finally, local governments are central to the task of rolling out energy efficiency measures for buildings based both on their traditional roles in regulating the built environment through development approval and administering national building codes, and through new extensions to those roles derived from collaboration with federal and state government initiatives. In NSW, for example, the local government development application process incorporated a Building Sustainability Index—BASIX—as a new standard in 2004, first in Sydney and then across NSW. BASIX requires energy and water efficiency targets to be met for all new residential buildings through design strategies for lighting, heating, cooling, and ventilation. In 2006, the coupling of

energy efficiency and the climate governance imperative led to BASIX being extended to renovations to existing residential buildings (above a given value) in recognition of the need to retrofit the *existing* urban built environment for resource efficiency.

In one sense, local governments' role in managing and promoting urban retrofit is a straightforward extension of their traditional town planning roles. However, the newly developed mechanism of Environmental Upgrade Agreements (EUAs) reposition local governments as major drivers of energy efficiency retrofits in city buildings and also as significant players in the financialisation of energy efficiency. The mechanism was pioneered in California in 2009 and was introduced by the Victorian state government in 2010 and followed in 2011 by NSW, while South Australia committed to the same in 2012. EUAs have some parallels to the C40/Clinton Climate Initiative Energy Efficiency Building Retrofit Program. They promote investment in environmental upgrades in commercial and multi-occupancy residential buildings. Through EUAs, local governments mobilise an innovative market-based 'environmental finance' product which mediates the provision of funds from financial institutions to commercial and multi-residential building owners for environmental retrofitting works, through a brokered three-way agreement between the local government, building owner and financial institution. Crucially, funds are recovered not directly by the financial institution but by the local government, by levying a new form of statutory charge—the environmental upgrade charge—which is linked to rates (property tax) collection. Echoing financial mechanisms in the UK's Green Deal, the charge remains on the rateable land until the funds have been repaid in full[x]. This innovation required changes to state legislation to enable the EUA's financial mechanisms to operate and, thus far, NSW and Victoria have enacted the amendments necessary. Significantly, EUA adoption is being facilitated by the federally-established company *Low Carbon Australia* which has established the Australian Environmental Upgrade Fund, and is working with major financial institutions *National Australia*

Bank and *Eureka Funds Management*, as a special purpose vehicle to provide EUA finance. Some highly significant urban local governments have adopted them: City of Sydney, the City of Melbourne which represent the CBDs of Australia's two largest cities and the two leading local government climate change activists (Acuto, 2012; Bulkeley and Schroeder, 2009) as well as North Sydney and Parramatta, while Penrith, Newcastle, Lake Macquarie and Wollongong, adjoining Sydney's greater metropolitan area, are also in the process of opting into the enabling legislative framework (ACELG, 2012).

EUAs are founded on a multi-level strategic collaboration. They have the capacity to drive new networks of relationship between local governments and federal government and to shift the pattern whereby few initiatives connect local governments with private sector actors towards a nexus of closer relations (Bulkeley and Schroeder, 2009; Hoff, 2010). *Low Carbon Australia* is currently working closely with the City of Melbourne on the financing of EUAs to support its $2b *1200 Buildings* program which aspires to the environmental retrofit of 1200 city buildings. EUAs signal one significant mechanism through which local government climate change activism—thus far especially in Sydney and Melbourne—is being recognised and formally integrated into Australia's climate and energy governance regimes.

Conclusion

Local governments—especially urban local governments—have a history of climate activism and of enacting energy efficiency and wider carbon reduction initiatives, including through their connection to international networks such as Cities for Climate Protection. Their particular capacities to advance energy efficiency have now become harnessable to national and state policy trajectories around climate governance, offering, in part, a ready made 'solution' to the climate

change problem. This is changing the strategic positioning of urban local governments—and indeed of the urban—as the governance regime increasingly dependent on enrolling local government in being able to respond climate change. These see local governments extending their roles beyond traditionally-expected involvement in community awareness and behaviour change initiatives and even beyond the role, nurtured by Cities for Climate Protection, of 'self-governing' local governments' own energy efficiency. Together these shifting alignments are opening new ground in the (Australian) urban politics of climate and energy governance, the lineaments of which are not yet clear. On the one hand the growing integration of local governments into a multi-level, if still evolving climate and energy governance 'regimes', can require them to perform in line with federal and/or state program goals. The focus on energy efficiency—with its emphasis on energy demand and consumption (rather than production and supply)—diminishes the challenges climate governance presents to the fossil-fuel dependent energy system that underlies Australia's urban-economic complex. Yet on the other it enables new forms of social and material agency as local government is resourced to enact energy efficiency measures they have long aspired towards (see Bulkeley et al., 2007). In the Australian context where local government is so weakly resourced, this represents a major opportunity. These aspects are in line with local governments' own calls for greater recognition that its "roles and activities should be seen as part of a systemic community- and economy-wide approach towards low carbon futures" (ACELG, 2012, 47).

As urban local governments are emplaced in experimental partnership collaborations (e.g. low income energy efficiency initiatives, the *Smart Grid Smart Cities* program, *City Switch;* see Table 1), they are provided an architecture whereby they might translate their climate and energy governance roles, heretofore focused on 'self-government' measures, into more extensive modes of 'provision' and 'enabling to govern through 'enabling' and 'provision' of new services and

technologies (see Bulkeley and Kern, 2006) and to push other government and private sector actors toward more transformative climate change and energy system responses that are less suggestive of 'business-as-usual' and more likely to achieve low carbon futures. Such potential can be seen, for instance, in the City of Sydney's decentralised energy masterplans which propose locating at least 360MW of low carbon generating capacity in precincts across the Sydney CBD. While this would be private sector owned and operated, its successful roll-out could historically reposition local government (and its ambition) in the energy supply system and locally transform that system and the climate impact of the city. Alternatively, depending on the nature of these collaborations, they may result in local government being constrained to working with market-based and financialisation innovations to drive energy efficiency (e.g. EUAs), enacting ecological modernisation and a form or urban environmental entrepreneurialism (see Whitehead, 2013). This certainly suggests the importance of ongoing research attention to the role of urban local governments in the governance of climate change and energy transitions and the need for particular attention the emergent new urban politics of climate change (see Bulkeley and Bestill, 2013).

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i The breadth and scope of local government action is evident from ICLEI's 2012 global forum which included the participation of the EU, World Bank and various section of the UN.

[ii] Their limited finances are derived chiefly through local land and property taxes or rates.

[iii] An example here is CitySwitch, see Table 1.

[iv] For example in 2011 the City of Sydney, which covers the CBD and inner city area, was certified as the first local government in Australia to be certified as carbon neutral under the federally-certified Carbon Offset Standard. The City of Melbourne recently also attained certified carbon neutral status.

[v] The Productivity Commission (2011) found 230 emissions reductions policies operating in Australia covering a gamut of governing practices: explicit carbon prices; subsidies (eg FiT, taxes, subsidies and grants); direct government expenditure; regulatory instruments (eg RETs, standards, energy efficiency regulation, mandatory assessment, urban or transport regulation); R&D support; and other (information provision, benchmarking, voluntary agreements).

[vi] The Garnaut Review (Commonwealth Government 2008) estimated energy prices increases of up to 40% in light of a carbon price.

[vii] The Clean Energy Act represents a political compromise which saw a planned *Carbon Pollution Reduction Scheme*—an Emissions Trading Scheme (ETS) covering 1000 major high-emitting entities—transformed to an interim fixed priced on carbon via a carbon tax covering 500 emitters. The carbon tax will convert to an ETS in 2015. Prior to the Clean Energy Act, federal policy efforts were generally based on voluntary measures that had a generally poor uptake (Griffiths et al.,2007).

[viii] For instance, the federal government funded Australian local governments' involvement in the international Cities for Climate Protection network from 1998 to 2008. This contributed to Australian membership having the fastest growth rate in the world (Hoff, 2010).

[ix] Diverse governing practices include: regulation, operationalised via mandatory standards, reporting, targets, and plans as well as via marketised mechanisms (eg tradeable certificates); grants, rebates and subsidies; funded demonstration projects; rating and standards systems; targeted information and advice services; and voluntary agreements (Commonwealth of Australia, 2009; Commonwealth of Australia, 2011; PMTGEE, 2010).

[x] The financial innovation also lies in the fact that finance security is not registered on the building title, so repayments remain with the property if ownership changes. Cost savings on energy efficiency can be used to service the debt and, with agreement, some repayment costs can be passed on to the tenant.

TABLE 1: Key federal and NSW state government energy efficiency policies and programs with implications for local government roles

ROLE FOR LOCAL GOVERNMENT	FEDERAL AND STATE ENERGY EFFICIENCY POLICY/PROGRAM AND FUNCTION
	FEDERAL LEVEL
Sets national enabling framework	***National Energy Efficiency Strategy****:* Agreement between national, state and territory governments to set out a work plan for energy efficiency improvements in all sectors of the economy. *Renewable Energy Targets (RET):* Sets the framework for the supply and demand of renewable energy via a Renewal Energy Certificates (REC) market. Requires energy retailers to provide 20% of their energy through renewables including through the purchase of tradeable certificates produced by business and/or householders. ***Clean Business Australia****:* Included (i) Green Building Fund: Support to commercial buildings for retrofitting and retro-commissioning to improve energy efficiency and reduce emissions: (ii) Retooling for Climate Change: Support to SME in manufacturing to improve energy and water efficiency in production: (iii) Climate Ready: support for R&D and commercialisation. ***Energy Efficiency Information Grants Program:*** Fund to assist industry associations and NFPs to provide information and advice to the small and medium enterprise and community organisations on smart energy choices. Aims to demonstrate how individual sectors can be more energy efficient.
Reconfiguring local infrastructure	***Community Energy Efficiency Program:*** Fund to assist local governments, Not-for-Profits and community organisations to undertake energy efficiency upgrades to community-use buildings, facilities and lighting. Aims to demonstrate and encourage the adoption of improved energy management practices. ***Local Government Energy Efficiency Program****:* Support local governing authorities to install solar or heat pump hot water systems in local community facilities to improve energy efficiency and reduce energy costs.
Partners in energy efficient/low carbon energy experimentation and demonstration	***Solar Cities:*** Series of demonstration projects by consortia of local governments with energy, finance and land corporations with a stake in urban and energy development. Designed to trial and demonstrate new solar and energy efficient technologies to showcase market viability and energy efficiency gains, while collecting data on use and costings. Being implemented in seven separate electricity grid-connected urban areas around Australia. ***Smart Grid Smart City:*** Demonstration project, focussed on Newcastle, NSW, to deliver Australia's first commercial-scale smart grid in partnership with the energy sector. Aimed to gather robust information about the costs and benefits of smart grids to help inform future decisions by government, electricity providers, technology suppliers and consumers. ***Green Precincts Fund:*** To support project initiatives that encourage water and energy saving and efficiency measures at the community level. Provides matching funding between $500 000 and $1.5 million, for up to 50 per cent of project costs to deliver high profile energy and water savings projects that demonstrate their achievements to the community.
Enabling retrofit	***Performance standards for buildings (Building Code of Australia):*** Energy efficiency standards. Part of the Building Code, covering new house and additions to existing houses. ***Low Income Energy Efficiency Program:*** Fund to assist consortia of government, business and community organisations to trial approaches to smarter energy use in low income households across Australia. Involves data capture and analysis to drive future approaches. ***Environmental Upgrade Agreements:*** Framework for tripartite financial agreement between building ownership, financiers and local governments to fund energy efficiency environmental upgrade works to existing buildings.

STATE LEVEL	
Sets state enabling framework	***NSW Greenhouse Gas Abatement Scheme****:* Baseline and credit emissions trading scheme. Uses emissions intensity rules to regulate electricity retailers, requiring them to meet mandatory benchmarks based on their market share. ***NSW Solar bonus:*** Provides feed in tariff with small solar or wind generators that are connected to the grid. ***NSW Home Savers Rebates:*** Rebates to NSW households for climate-friendly hot water systems, ceiling insulation, dual flush toilets, hot water circulators, rainwater tanks or water efficient washing machines. Funded by NSW Climate Change Fund. ***Energy Efficiency Community Awareness Program:*** Information service providing practical advice on saving energy at home and work. Includes auditing techniques, *Power Pledge* personal action plans. ***Energy Efficiency for Small Business Program:*** Provides small business with subsidised energy assessment, development of Energy Action plan, and 50% subsidy to cost of installing improvements. ***Energy Saver:*** Aimed at medium to large organisations. Offers subsidised energy audits, develop provide business cases with payback periods and an implementation plan covering technology upgrades and retrofits, improved maintenance procedures or staff behavioural changes. Funded by NSW Climate Change Fund. *Energy Savings Action Plans:* NSW largest energy users (267) required to produce Energy Saving Action Plans which require approval.
Reconfiguring local infrastructure	***Public Facilities programs:*** Funds water and energy savings in public and community facilities in NSW. Aims to showcase technologies in action to encourage uptake by the wider community. 71 demonstration projects funded (demonstration stream funding ceased following 2009 rationalisation). Funded by NSW Climate Change Fund. ***NSW Fleetwise Partnership:*** Targets NSW based businesses, not-for-profit organisations, and local councils that have 20 or more fleet vehicles to assist reduction in fleet emissions via information, online tools and advice.
Enabling retrofit	***Environmental Upgrade Agreements:*** Framework for tripartite financial agreement between building ownership, financiers and local governments to fund energy efficiency environmental upgrade works to existing buildings. ***BASIX:*** Mandates energy and water savings targets (compared to pre-BASIX baseline) as part of the development approval (DA) process for new residential developments and renovations requiring DA. All residential development applications require a BASIX Certificate. Online program allows builders and home owners to assess the most cost effective options to attain the required energy and water savings. ***CitySwitch:*** a partnership between the NSW Office of Environment and Heritage and local government , established initially with the LGAs of City of Sydney, North Sydney Council, Parramatta City Council. Now a national program, led by the Council of Capital City Lord Mayors. Works in partnership with businesses in local government commercial districts to reduce the energy demands and enhance the energy efficiency of major office tenancies. ***National Australian Built Environment Rating System:*** National rating system for the environmental performance of existing buildings. Managed by the NSW government on behalf of the national, state and territory governments.